

THURSDAY, FEBRUARY 18, 1875

## THE LOAN COLLECTION OF SCIENTIFIC INSTRUMENTS

WE do not think we are going too far in assuming that the unusually influential meeting held at South Kensington last Saturday may be regarded as the first and a very emphatic step in a most important work. What the nature of that meeting was will be seen from the following report, which has appeared in most of the daily papers:—

"A meeting was held at South Kensington on Saturday for the purpose of discussing the advisability of bringing together a loan collection of scientific apparatus. The Duke of Richmond, the Lord President of the Council, took the chair, the Vice-President, Lord Sandon, being also present. The following noblemen and gentlemen attended the meeting:—Lord Hampton, President of the Institute of Naval Architects; Prof. Abel, Chemist to the War Department; Dr. Allman, President of the Linnean Society; Mr. W. B. Bascomb; Prof. F. A. Bradley; Mr. F. J. Bramwell, President of the Institution of Mechanical Engineers; Mr. H. Cole, C.B.; Admiral Collinson, C.B.; Mr. G. Dixon, M.P.; Prof. W. T. Thiselton Dyer; Prof. G. Carey Forster; Prof. E. Frankland; Dr. Gladstone, President of the Physical Society; Prof. Goodeve; Mr. T. E. Harrison, President of the Institution of Civil Engineers; Dr. Hooker, C.B., President of the Royal Society; Prof. T. H. Huxley, Secretary of the Royal Society; Mr. J. Norman Lockyer; Mr. C. W. Merrifield; Prof. Odling, President of the Chemical Society; Prof. Ramsay; Major-General Sir H. Rawlinson, K.C.B., President of the Royal Geographical Society; Dr. Burdon-Sanderson, Vice-President of the Royal Society; Mr. T. Savage; Sir J. P. Kay-Shuttleworth, Bart.; Mr. C. W. Siemens; Mr. Warington Smyth; Rev. J. Twisden; Prof. Tyndall, President of the British Association; Prof. W. C. Unwin; Sir J. Whitworth, Bart.; and Dr. J. Woolley. On the motion of the President of the Royal Society, it was unanimously agreed that such an exhibition would be most instructive and valuable. The question of the limits of the collection was discussed, and sub-committees were appointed to deal with the various branches of science to which it is proposed the collections should have reference. It was generally understood that the main objects of the exhibition would be to show modern apparatus for teaching and for research; the applications of science to industry; and such apparatus as is historically interesting from the occasions in which, or the persons by whom, it had been employed. The exhibition will be opened at the commencement of June. It is, however, doubtful at present whether all branches of science will be taken during this year, or whether the exhibition will be extended over two years, as the space disposable in the South Kensington Museum, where the exhibition is to be held, is rather restricted."

The presence at a meeting of this kind of two such influential members of her Majesty's Government as the Duke of Richmond and Lord Sandon may, we think, be taken as significant that the present Government is willing to do what it can for the advancement of science and of scientific education, and in order to do this, is seeking to learn what its duties are in the matter. The tone of the reply of the two above-named Ministers to the King's College deputation last week is quite in accordance with this view.

The meeting was altogether a remarkable one, consisting as it did of two of her Majesty's Ministers, together with many of the most eminent men of science in the country; and their unanimity in favour of the proposal is a proof of its high importance, and we hope a guarantee of its success.

With regard to the proposal itself, the wonder is that no steps have long ere now been taken to organise a Museum for the illustration of the Physical, Chemical, and Mechanical Sciences. One of the recommendations contained in the Fourth Report of the Commission on Scientific Instruction and the Advancement of Science proposes the formation of a collection of physical and mechanical instruments, and submits for consideration whether it may not be expedient that this collection, the collection of the Patent Museum, and that of the Scientific and Educational Department of the South Kensington Museum, should be united and placed under the authority of a Minister of State. In our article on this Report (*NATURE*, vol. ix. p. 397) we went so fully into the subject that it is unnecessary to dwell again upon it now. Why the particular departments mentioned above should be left out in the cold it would be difficult to give a reason for; probably, as we before suggested, it has been simply from want of thought; and now that so many eminent men of science have met together, under the auspices of two members of her Majesty's Government, we may hope that the great gaps in our system of Museums will not remain long unfilled up. Natural History, including Geology, Zoology, Botany, not to mention nearly every practical application of science, such as Mining, &c., have, in London at least, resources for the practical study of their history and methods; and we are exceedingly glad that this is the case. Greatly on this account, we believe, is it that these sciences are so popular, and that so much more is known about their results among the people at large, than about the various departments of the Physical Sciences. If a student in any of the above sciences wants to pursue an investigation on any point connected with their history, their methods, or their results, he has magnificent scope for so doing both in London and in other large towns throughout the country. But the unfortunate student of any department of the Physical Sciences—Electricity, Magnetism, Heat, Light, Chemistry—if he wants to study thoroughly or to investigate any point connected with his subject, has nothing for it but to buy his apparatus, borrow it from a friend, or perhaps only look at it in a shop window.

A collection which exemplifies the history of the progress of any science may be made both interesting and instructive; and of all the sciences none can be more aptly and fully illustrated in this respect than the Physical Sciences. How interesting even to the uninitiated was the recent exhibition of a historical series of musical instruments at South Kensington; but how much greater would be the interest that would attach to, and how much higher the instruction to be derived from, a collection of apparatus that would exhibit the progress in the single department of Optics, say from Newton down to Cornu and Fizeau, embracing as it might very well do all the work that has been done in recent years by means of the prism. So in the department of Heat in all its branches,

how intensely interesting and instructive a collection might be made. The mere mention of other subjects—Electricity, Magnetism, Acoustics, &c.—suggests possibilities of magnificent collections which might be formed, if only the public spirit of fortunate possessors could be properly roused; and on this latter point there need, we think, be no fear.

One condition, we think, ought to be insisted on: the collection which it is proposed to form should be almost entirely confined to the region of scientific research and instruction, and should include as little as possible of the practical applications of science, which, indeed, have hitherto had almost wholly their own way in our exhibitions and museums. It should be distinctly understood and acted upon, that the collection which it is hoped will be opened at South Kensington in a few months is meant to illustrate the history and methods of abstract scientific research, of the true nature of which the public know really nothing, and of teaching. Our friends the engineers and other practical men, we are sure, will see the fairness of our demand, and they are so powerful, and have hitherto been so largely represented, that they can well afford to be generous in this matter.

While one great value of the collection about to be formed will no doubt be from a historical point of view, it cannot but serve also an important educational purpose. It will let the public see how multifarious are the ways of science, will show them that it is no mere child's play, and tend to impress them more and more with the great importance of scientific education as a means of culture and mental training. When the claims of scientific research upon Government are advocated, those who are familiar with such a collection will know what is spoken of, and for what purpose the public money is wanted.

We hope, and indeed believe, that the experiment about to be tried at South Kensington is simply the first step towards something more permanent and much more extensive—in short, the fulfilment of the second part of the recommendation of the Commission quoted above. We believe that if such a collection is once formed, if it be properly organised and arranged and made perfectly intelligible to the public, both as to its theoretical principles and practical bearings, it will in time lead to a scheme as comprehensive, as complete, and as invaluable as the French Conservatoire des Arts et Métiers, to which we have frequently referred as a model which our Government would do well to copy. The unsatisfactory state of our Museums, their want of system, and incompleteness, we have often insisted upon. We think we are now on the road towards mending this latter defect; other defects can only be remedied by the adoption of the Commission's recommendation, to unite the principal collections under one responsible Minister of State. It would without doubt be greatly to the advantage both of the science and the industry of the country to have collected and arranged in one establishment, supported by Government, all the apparatus and illustrations of all the processes connected with every department of science, pure and applied, abstract and practical, instead of the heterogeneous and imperfect collections at present scattered in various buildings under different systems of management.

### CAVE HUNTING

*Cave Hunting.* Researches on the Evidence of Caves respecting the Early Inhabitants of Europe. By W. Boyd Dawkins, M.A., F.R.S., &c. (London: Macmillan and Co., 1874.)

NO wonder that timid wanderers, peering into the dark mysterious depths of some abyss, should in their awe have peopled them with gnomes and goblins, or fancied themselves at the portals of another world. Well might poetic fancy, stirred by the thousand flashes thrown back from the spar-spangled walls of some vast cave, have called up fairy forms to give life to the beautiful stillness of the scene. Less weird and less poetic, but not less interesting, are the associations gathered by history and tradition around caves. We hear of rude tribes who habitually lived in rocky fastnesses occupying the caves for shelter and protection; and even when these were not used as permanent dwellings, we learn that in troublous times many a clan, family, or individual have had to leave their comfortable homes and betake themselves to the caves and holes of the rocks. We might well expect, therefore, that in the earliest age, when uncultured man fought for the richest hunting-ground, or struggled with nature for bare subsistence, the caves and rock-shelters should often have been his home.

We read again of the Patriarch purchasing the Cave of Machpelah as a burying-place for his family. Are we to suppose that this was a custom then newly introduced, or ask whether it was not probable that the associations of thought likely to spring up in the social life of the simple pastoral tribes of primæval man would not soon teach him to bury his dead out of his sight instead of casting them out to be devoured by wild beasts, and that he should then choose the tombs offered by nature and bury in caves? On searching for evidence on this point, we soon find that from almost the earliest time of which we can learn anything with respect to the human race, men lived and died in caves, and a later people of somewhat different habits buried in them; what the earlier race did with their dead is not quite clear.

Deposits in caves are generally more or less protected from the destroying agents which attack outside superficial deposits, and so we have in them a vast store of odds and ends, dropped, thrown away, or buried, which enable us to form a fair idea of the habits of the life of man long before the period to which history or tradition can reach back, and also of other creatures which lived with him or haunted the neighbourhood in those ancient times.

Caves are of all ages, and are formed in many ways. There are bone-bearing fissures of Rhætic age. The phosphate beds of Caylus, full of bones of mammals, from early Tertiary to recent, are only ancient swallow-holes and caves. But the cave deposits we have to consider now are all post-tertiary, and are due almost entirely in the first instance to the decomposition of limestone rocks by the action of acidulated water. Mechanical action comes in afterwards and enlarges and finishes the work. There is, however, a difficulty as to how this action goes on in some sheltered places which rain cannot reach and where no water appears to run, such as many of the rock-shelters or abris. A probable explanation in some